UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/866,411	05/26/2001	Claus Skaanning	10012829-1	4978

		EXAMINER
7590	11/16/2004	STARKS, WILBERT L

IP Administration
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ART UNIT	PAPER NUMBER
2121	

DATE MAILED: 11/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
Office Action Summary	09/866,411	SKAANNING ET AL.
	Examiner	Art Unit	
	Wilbert L. Starks, Jr.	2121	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 August 2004*.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
   closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-36* is/are pending in the application.

   4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-36* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

   Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

   Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   a)☐ All   b)☐ Some * c)☐ None of:

   1.☐ Certified copies of the priority documents have been received.

   2.☐ Certified copies of the priority documents have been received in Application No. _____.

   3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
      application from the International Bureau (PCT Rule 17.2(a)).

   * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
   Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
   Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1.   The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2.   Claims 1-36 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1 and 19 provide for using a Bayesian Network structure to identify underlying issues and associated sub models, but, since the claims do not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. As disclosed, the above mentioned claims focus on the use of a Bayesian Network without delineating the steps or process used to instantiate the subordinate issues and sub-models cited. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced.

More precisely, Applicant discloses the following in independent claim 1:

> (b.1) using a Bayesian network structure to **identify the underlying issue and the associated sub model**; (emphasis added.)

Independent claim 19 contains a similar disclosure. The problem with these claims is that a "Bayesian network" is a type of algorithm called a "supervised" learning method. That is, the user must *already know* the system's required input/output characteristics,

system states, and probabilities that make up the inference network before constructing

it. An "unsupervised" learning method is one where the patterns in the data are

unknown and the learning method _automatically_ discovers those patterns on its own

without assistance (or "supervision" from the user) and <u>configures itself</u> accordingly.

Applicant's claim to "...using a Bayesian network structure <u>to **identify** the underlying

issue and the associated sub model;**" (emphasis added) is a claim to using a

<u>supervised</u> learning method in an <u>unsupervised</u> manner. To one of ordinary skill in the

art, this statement is nonsensical and suggests that some pattern discovery steps are

<u>missing</u> in the disclosure. If pattern discovery steps are missing in the disclosure,

Applicant has failed to particularly point out and distinctly claim the subject matter which

Applicant regards as the invention, as required under 35 U.S.C. 112, second paragraph.

Accordingly, Examiner holds that all the independent claims, and their dependents, fail

to particularly point out and distinctly claim the subject matter which Applicant regards

as the invention, as required under 35 U.S.C. 112, second paragraph.

Claim Rejections - 35 USC § 101

3.   35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

4. Claims 1-36 are rejected under 35 U.S.C. 101 because the invention as disclosed in

claims 1 and 19 is directed to non-statutory subject matter. While the claims are in the

technological arts, they are not limited to practical applications in the technological arts.

Specifically, the claims focus on a series of steps to be performed on a computer, but the ideas are disclosed abstractly from any particular practical application. Claims 1 and 19 provide for a method and system which employs a Bayesian Network structure to identify underlying issues and associated sub models, but fail to disclose the steps necessary to enable the claimed process.

To constitutionally interpret the word "process", the Supreme Court has held that: "***A process is a mode of treatment of certain materials to produce a given result. It is an act, or a series of acts, performed upon the subject matter to be transformed and reduced to a different state or thing. ***The Process requires that certain things should be done with certain substances, and in a certain order; but the tools to be used in doing this may be a secondary consequence."(Emphasis added) Diamond, Commission of Patents and Trademarks v. Diehr and Lutton, 209 USPQ 1, 6 (1981) quoting Cochrane v. Deener, 94 U.S. 780, 787-788 (1876).

This Constitutional interpretation of the word "process" is a long-standing one that the Supreme Court requires to be applied in interpreting 35 U.S.C 101. Diamond v. Diehr at 6. Consequently, the us of that interpretation is Constitutionally required when we interpret the Federal Circuit's standard that a "new and useful process" is one that produces a useful, concrete, and tangible result". Cf. State Street Bank & Trust Co. v. Signature Financial Group, Inc., 47 USPQ2d 1596, 1600-1601 (Fed. Cir. 1998).

Applicant discloses no "certain substances" that have been "transformed or reduced" in that applicant's claims disclose no specific computer-readable medium, no manipulation of specific data representing physical objects or activities (pre-computer activity), nor do they disclose any specific independent physical acts being performed by the invention (post-computer activity).

Further, claims 1-18 are directed at a method for selecting sub-models without disclosing any computer implemented processing. Abstract ideas (see Warmerdam, 33 F.3d at 1360, 31 USPQ2d at 1759) or the mere manipulation of abstract ideas (see Schrader, 22 F.3d at 292-93, 30 USPQ2d at 1457-58) are not patentable.

As disclosed, independent claim one focuses on nonfunctional descriptive material, which is inclusive of the mere arrangement of data without engaging functionality when employed as a computer component.

Claim 19 focuses on a system used in selecting sub-models, wherein the elements are recited in means plus function format, however the claim fails to define a statutory specific machine. A machine or manufacture or system claim may be one of two types: (1) a claim that encompasses any and every machine for performing the underlying process or any and every manufacture that can cause a computer to perform the underlying process, or (2) a claim that defines a specific machine or manufacture.

When a claim is of the first type, Office personnel are to evaluate the underlying process the computer will perform in order to determine the patentability of the product.

The mere fact that a hardware element is recited in the claim does not necessarily limit the claim to a specific machine or manufacture. If a product claim encompasses any and every computer implementation of a process, when read in light of the specification, it should be examined on the basis of the underlying process. Such a claim can be recognized, as it will define the physical characteristics of a computer or computer component exclusively as functions or steps to be performed on or by a computer, and encompass any and every product in the stated class, configured in any manner to perform the process.

Claims that define a computer related invention as a specific machine or specific article of manufacture must define the physical structure of the machine or manufacture in terms of its hardware or hardware and "specific software." The applicant may define the physical structure of a programmed computer or its hardware or software components in any manner that can be clearly understood by a person skilled in the relevant art. Generally a claim drawn to a particular programmed computer should identify the elements of the computer and indicate how those elements are configured in either hardware or a combination of hardware and specific software.

Response to Arguments

4.   Applicant's arguments filed 10 August 2004 have been fully considered but they

are not persuasive. Specifically, Applicant argues the following:

Argument 1

> In any event, regardless of what methodology is used, one of ordinary skill in
> the pertinent art, when reading the claims in the light of the supporting
> specification, <u>would be able to ascertain with a reasonable degree of
> precision and particularity</u> **whether a Bayesian network structure is used
> to identify an underlying issue and associated sub model**, as set out in
> substep (b.l) of claim 1. (emphasis added.)

Examiner disagrees. As noted before, the problem with these claims is that a

"Bayesian network" is a type of algorithm called a "supervised" learning method. That is,

the user must *already know* the system's required input/output characteristics, system

states, and probabilities that make up the inference network before constructing it. An

"unsupervised" learning method is one where the patterns in the data are unknown and

the learning method *automatically* discovers those patterns on its own without

assistance (or "supervision" from the user) and <u>configures itself</u> accordingly. Applicant's

claim to "...using a Bayesian network structure <u>to identify</u> **the underlying issue and**

the associated sub model;" (emphasis added) is a claim to using a <u>supervised</u>

learning method in an <u>unsupervised</u> manner. To one of ordinary skill in the art, this

statement is nonsensical and suggests that some critical pattern discovery steps are

<u>missing</u> in the disclosure. In fact, Applicant admits that:

> Applicant does agree with Examiner that substep (b.1), mentioning a
> Bayesian network structure, <u>could include additional substeps further</u>

> breaking down and describing subordinate issues, etc. However, this is true
> of any step or substep in any claim ever written. Such breaking down of
> steps and substeps ad infinitum is not required by the patent laws. Indeed
> since every conceivable step or substep can be broken into additional
> subparts, it would seem impossible to come up with any step or. substep that
> could not be further broken down to instantiate subordinate issues.

Examiner does not seek the "breaking down of steps and substeps ad infinitum," as Applicant suggests.

Examiner notes that Applicant is using a supervised learning method to perform an unsupervised task. To one of ordinary skill in the art, this is a nonsensical claim if no further explanation is provided. One possible explanation for why the claim is written this way is that further pattern discovery steps are missing from the disclosure.

If pattern discovery steps are missing in the disclosure, Applicant has failed to particularly point out and distinctly claim the missing subject matter which Applicant seems to regard as the invention, as required under 35 U.S.C. 112, second paragraph.

Specifically, what kind of pattern discovery method is used? Is it used to modify the standard Bayesian network to become an unsupervised learning algorithm? If so, how? If not (that is, if the pattern discovery method is implemented in series with the Bayesian network), then why is it claimed that the Bayesian network does the identification when actually it is another system that is in series with it that performs the task? Applicant's nonsensical disclosure raises many questions to the mind of one of ordinary skill in the art.

Examiner notes that all the independent claims contain this uncured defect.

Accordingly, all the independent claims and their dependents, are held by Examiner to

fail to particularly point out and distinctly claim the subject matter which Applicant

regards as the invention, as required under 35 U.S.C. 112, second paragraph. The

rejections of claims 1-36 are proper and stand as FINAL.

Argument 2

Regarding the 101 rejection of claim 1, Applicant argues:

> Examiner has failed to show that any abstract idea (e.g., scientific principle,
> law of nature, idea, or mental process, which may be represented by a
> mathematical algorithm) or manipulation of abstract ideas even exist in Claim
> 1. Rather, all the steps set out in claim 1 are concrete actions that are
> performed towards the end of selecting and using a sub model for issue
> solution.

Examiner disagrees. Well within the broadest interpretation of Applicant's term

"model" is the term "mathematical algorithm." Furthermore, the scope of the term

"model" also contains the terms "logical algorithm" (that is, a mathematical algorithm

that is Boolean in nature), "fuzzy logic algorithm", "computer program per se"...it even

contains pure human thoughts as "models". Note that mathematical algorithms alone

are so abstract from limitations to practical applications that they have been held to be

per se nonstatutory by the Supreme Court. The same is true for computer programs per

se and pure human thought.

Applicant's term "model" is so abstract, it does not even limit the claims to mathematical algorithms, computer programs per se, logical algorithms, or even pure human thought...much less providing limitations to <u>practical applications</u> of the art.

Applicant's "selecting and using a 'sub model' for issue solution", whether that actually means selecting a "sub algorithm" or "sub program per se", provides no limitation of the claims to concrete or tangible subject matter...it doesn't even limit the claims to specify whether mathematical algorithms or computer programs per se or pure human thoughts are used.

Applicant's argument is unpersuasive. The 101 rejection of claim 1 STANDS.

Argument 3

In step (a), first information about a presenting issue is obtained from a user.
This is <u>a concrete action wherein a user provides specific information</u>.

Again, <u>what kind</u> of information is being provided? Is it purely mathematical numbers? Is it Boolean data? Is it fuzzy logic data? Is it natural language data? There is no disclosure in the claims to limit them one way or the other...much less limit them to real-world data related to some practical application of the art. The claim of "specific information" is insufficient to limit them to real-world data.

Applicant's argument is unpersuasive. The 101 rejection of claim 1 was proper and, therefore, STANDS.

Argument 4

In step (d), the sub model uses the additional information to identify a
solution to the underlying issue. This identification of the solution is not only
concrete, but it is also useful. For example, if the presenting issue is a
product malfunction (see for example claim 2), then identifying a solution to
the malfunction can result in the useful repair of the product malfunction.

Hmmm...

Is the supposed "product" a mathematical algorithm? It could be.

Is the supposed "product" a computer program per se? It could be.

Again, Applicant has not limited his claims to practical applications, much less

whether the "method" he claims is a mathematical algorithm, computer program per se,

or even a "product" consisting of pure thought. Applicant's argument is unpersuasive.

The 101 rejection of claim 1 was proper and, therefore, STANDS.

Argument 5

The Specification indicates many uses of the invention in a variety of
application areas such as diagnostic applications, decision support,
selection, classification, prediction, brokering (e.g., brokering of stocks in
companies) See for example, the Specification at page 6, lines 14 through
19. None of these are abstract ideas, but are useful results of the method set
out in claim 1.

Then, why are those apparent limitations not incorporated into the claims? 35

U.S.C. §101 is a claim rejection...not an objection to the Specification.

More precisely, Claim 1 contains disclosures of certain steps, but they are not

written in "step-for" format. Therefore, the apparent "limitations" found in the

Specification cannot be "read into" the claims under in re Donaldson. The claims stand

or fall on their own limitations, read in light of the Specification (that is, in order to

interpret ambiguities in the claims). Applicant's disclosures in the Specification could

provide support for limitations in the claims, but at present, no such limitations exist in

the claims.

On this basis, the §101 claim rejection of claim 1 STANDS.

Argument 6

Examiner has asserted that the elements of claim 19 are recited in means plus function format. This is incorrect. There is no means plus function language in claim 19. Claim 19, therefore, does not recite any elements in means plus function format. Claim 19 is an apparatus claim of the type that is generally not subject to rejection based on 35 U.S.C. § 101.

Examiner agrees with Applicant that claim 19 is not written in "means-plus-

function" format. Therefore, the apparent "limitations" found in the Specification cannot

be "read into" the claims under in re Donaldson. The claims stand or fall on their own

limitations, read in light of the Specification (that is, in order to interpret ambiguities in

the claims). Applicant's disclosures in the Specification could provide support for

limitations in the claims, but at the present moment, no such limitations exist in the

claims.

Applicant argues further that apparatus claims are not subject to rejections based

on 35 U.S.C. §101.

The Federal Circuit disagreed.

Specifically, the Federal Circuit held in *AT&T v. Excel*, 50 USPQ2d 1447 (Fed.

Cir. 1999) that:

> Whether stated implicitly or explicitly, we consider the scope of
> Section 101 to be **the same regardless of the form** -- machine or process
> -- in which a particular claim is drafted. AT&T v. Excel, 50 USPQ2d 1447,
> 1452 citing In re Alappat, 33 F.3d at 1581, 31 USPQ2d at 1589 (Rader, J.,
> concurring) (emphasis added.)

Examiner considers the scope of Section 101 to be the same regardless of

whether Applicant *claims* a "process", "machine", or "product of manufacture". While

the "system" recitals in the preamble of claim 19 makes the claim ostensibly drawn to an

"apparatus" claim, that is insufficient by itself to limit the claim to statutory subject

matter. On this basis, the §101 claim rejection of claim 19 STANDS.

Conclusion

5.   **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time

policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later

than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the

Examiner should be directed to Wilbert L. Starks, Jr. whose telephone number is (571)

272-3691.

Alternatively, inquiries may be directed to the following:

S. P. E. Anthony Knight   **(571) 272-3687**

After-final (FAX)   **(703) 746-7238**

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WLS

10 November 2004

Wilbert L. Starks, Jr.
Primary Examiner
Art Unit - 2121